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WEINGARTEN, SCHURGIN, GAGNEBIN & LEBOVICI LLP
TEN POST OFFICE SQUARE
BOSTON, MA 02109

EXAMINER
MOYER, MICHAEL J

ART UNIT	PAPER NUMBER
2675	24

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/589,299	SPITZER, MARK B.
	Examiner	Art Unit
	Michael J. Moyer	2675

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *19,22,23* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

FINAL DETAILED ACTION

Response to Amendment

1. The amendment filed on has been considered. Before claims 1-38 were pending, now claims 1-44 are pending. Claims 1, 13 and 21 have been amended to which 13 and 21 are also independent claims. Claim 28 has been amended to be dependent from 1 or 13 or 21 and claims 39-44 are new.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 14-20 depend from amended claim 13, which was amended to reflect claim 1 and the eyepiece assembly being hollow, transparent, spherical housing. However, claims 14-20 still refer to a curved housing in which claim 13 used to incorporate that limitation before being amended. The examiner will interpret the claims that curved will mean spherical.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7, 9-11, 28-29 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji et al. (hereinafter "Amafuji") US 6,292,158 B1 in view of Rallison et al. (hereinafter "Rallison"), US 5,949,583.

As pertaining to claim 1, Amafuji discloses a compact display device 201 for

transmitting an image to a user's eye, the display device comprising: a head-mountable support fixture 203 comprising an elongated member having a first end and a second end 204c; a projection system 204 including a display 204a operative to provide an image, the support fixture 204c attached at the first end to the projection system 204; and an eyepiece assembly 204b attached to the second end of the support fixture 204c; wherein the support fixture 204c maintains the projection system 204 and the eyepiece assembly 204b in alignment along an optical path through free space between the projection system 204 and the eyepiece assembly 204b, with the projection system 204 disposed to transmit the image on the optical path and the eyepiece assembly 204b disposed to receive the image from the projection system 204 and to direct the image to the user's eye 6 (Fig. 5).

As pertaining to claim 1, Amafuji does not disclose an axial optical system.

As pertaining to claim 1, Rallison discloses a head mounted display system in which on-axis or axial system is used (col. 2, lines 8-16; col. 3 lines 7-20).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the on-axis or axial system of Rallison with Amafuji.

The suggestion/motivation for doing so would have been to provide HMD that produces virtual images with a minimal amount of aberrations, therefore allowing for better image quality and light efficiency.

As pertaining to claim 2, Amafuji teaches the device of claim 1, wherein the support fixture comprises a post oriented off the optical path (Fig. 5). Claim 2 is dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 3, Amafuji teaches the device of claim 2, wherein the post is curved Fig. 5). Claim 3 is dependent on claims 1 and 2 and is rejected on the same basis and what is stated above.

As pertaining to claim 4, Amafuji teaches the device of claim 1, wherein the display comprises a liquid crystal display 235, an electroluminescent display, a field emission display, or a cathode ray tube (col. 10, lines 43-54; Fig. 6). Claim 4 is dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 5, Amafuji teaches the device of claim 1, wherein the projection system further comprises an illumination source 232 (col. 10, lines 43-54; Fig. 6). Claim 5 is dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 6, Amafuji teaches the device of claim 1, wherein the eyepiece assembly 204b comprises a reflecting surface oriented to direct the image to the user's eye and a lens (col. 10, lines 1-2; col. 11, lines 1-7; Fig. 5-6). Furthermore, Rallison teaches a reflecting surface oriented to direct the image to the user's eye and a lens (figs. 1-2 and 5-6). Claim 6 is dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 7, Amafuji teaches the device of claim 1, wherein the eyepiece assembly allows passage of ambient light to the user's eye (Fig. 5). Furthermore, Rallison teaches the allowance of ambient light to the user's eye (col. 2, lines 63-67 and col. 3, lines 1-5). Claim 7 is dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 9, Amafuji teaches the device of claim 1, wherein the projection system further comprises a reflecting surface 232 oriented to direct light from the display onto the optical path through free space (col. 10, lines 43-52; Fig. 6). Claim 9 is dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 10, Amafuji teaches the device of claim 1, wherein the projection system further comprises a diffusion panel 236, which can be construed as a lens because it is

used for uniforming unevenness in the light from the back light 232 (col. 10, lines 43-52; Fig. 6). Claim 10 is dependent of claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 11, Amafuji teaches the device of claim 1, wherein the projection system is disposed within a housing 204, and the housing is attached to the support fixture at the first end (Fig. 5). Claim 11 is dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 28, Amafuji teaches the device of claim 1, further comprising a housing, the projection system disposed within the housing, circuits and wiring in electrical communication with the projection system disposed within the housing, and the support fixture attached to the housing (Fig. 5-6). Claim 28 dependent on claim 1 and is rejected on the same basis and what is stated above.

As pertaining to claim 29, Amafuji teaches the device of claim 28, further comprising a mounting device configured to mount the housing to a headband 203 (Fig. 5). Claim 29 is dependent on claims 1 and 28 and is rejected on the same basis and what is stated above.

As pertaining to claim 37, Amafuji teaches a computer in communication with the display device of claim 1 (col. 1, lines 4-7). Claim 37 is dependent on claim 1 and is rejected on the same basis and what is stated above.

4. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji and Rallison, as applied to claim 1 above in view of Taniguchi et al. (hereinafter "Taniguchi"), US 6,023,253.

Amafuji and Rallison disclose what has been previously stated above. Rallison does suggest that his invention can include some of the limitations (col. 8, lines 12-67 and col. 9, lines 1-11).

Amafuji and Rallison do not disclose the eyepiece assembly comprising a polarization beam-splitter coating, a quarterwave plate, and a focusing mirror arranged so that polarized light from the projection system passes the beam splitter coating and the quarterwave plate and is reflected from the focusing mirror to pass in the opposite direction through the quarterwave plate and is reflected from the beam-splitter coating toward the user's eye.

Taniguchi discloses an eyepiece assembly comprising eyepiece assembly comprising polarization beam splitter 4, a quarterwave plate 18, a concave half mirror 19, which can be construed as the focusing mirror because it is used to reflect the light from the quarter wave plate to pass through the opposite direction through the quarterwave plate and is reflected from the beam splitter toward the user's eye 9 (col. 11, lines 43-62; Fig. 9).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the eyepiece assembly of Taniguchi with the eyepiece of Amafuji and Rallison.

The suggestion/motivation for doing so would have been to provide a better eyepiece assembly that allows for increased or improved observation in which there is a higher luminance and definition of the picture being observed by the user. Claim 8 is dependent on claim 1 and is rejected on the same basis and what is stated above.

5. **Claims 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji and Rallison as applied to claim 1 above, in view of Ronzani et al. (hereinafter "Ronzani"), US 5,844,656.

As pertaining to claim 12, Amafuji and Rallison disclose what has previously been stated, see claim 1 for rejection.

As pertaining to claim 12, they do not disclose the eyepiece assembly is disposed within a curved housing.

As pertaining to claim 12, Ronzani discloses a HMD display in which the eyepiece assembly is hollow and spherical and therefore curved (figs. 1-9).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the curved eyepiece assembly of Ronzani with that of Amafuji and Rallison.

The suggestion/motivation for doing so would have been to provide for a better eyepiece assembly which can be encased or housed to allow for a better image to be produce without any outside distractions or interferences, i.e. wind, rain, snow etc. Claim 12 is dependent on claim 1 and is rejected on the same basis and what is stated above.

6. **Claims 13-15, 19, 28 and 41** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji and Rallison as applied to claim 1 above, in view of Ronzani et al. (hereinafter "Ronzani"), US 5,844,656 and in further view of Handschy et al. (hereinafter "Handschy"), US 5,596,451.

As pertaining to claim 13, Amafuji, Rallison and Ronzani disclose what has previously been stated above (see claims 1 and 12).

As pertaining to claim 13, they do not disclose the eyepiece assembly being transparent.

As pertaining to claims 13, Handschy discloses an assembly for producing a visual image, in which the assembly uses a cube that is transparent. This assembly would also allow ambient light to transmit or pass through the assembly. The assembly can comprise additional cubes or a single cube (col. 10, lines 34-43). The assembly would be similar to the eyepiece assembly in question because it allows the user to view an image in front of their eye.

At the time the invention was made, it would have been obvious to a

person of ordinary skill in the art to combine the transparent cube or assembly of Handschy with the eyepiece assembly of Amafuji, Rallison and Ronzani.

The suggestion/motivation for doing so would have been to provide a more efficient eyepiece that allows the user to see not only the image being viewed but also the surrounding of the user. Furthermore, outside ambient light can now used to further help the process of the image. Also, this assembly may help the user avoid eyestrain because one eye does not have to compensate for the other eye not being used because now both eyes are able to see the outside environment or surroundings while the one eye is also viewing an image.

As pertaining to claim 14, Handschy discloses the eyepiece assembly comprising a beam splitter film 64, a quarterwave plate 58, a reflecting mirror or focusing mirror 42 so that the polarized light passes through the beam splitter, goes through the quarterwave plate then is reflected off the mirror to pass in the opposite direction back through the wave plate and is then reflected from beam splitter to the user's eye (col. 4, lines 52-67; col. 5, lines 1-62; Fig. 2A). It would be obvious to replace the eyepiece assembly of Amafuji, Rallison and Ronzani with Handschy because it allows for increased or improved observation in which there is a higher luminance and definition of the picture being observed by the user. Claim 14 is dependent on claim 13 and is rejected on the same basis and what is stated above.

As pertaining to claim 15, Ronzani discloses wherein a further lens is disposed within the spherical housing (figs. 1-9). Claim 15 is dependent on claims 13-14 and is rejected on the same basis and what is stated above.

As pertaining to claim 19, Amafuji discloses the device of claim 1, wherein the eyepiece assembly allows passage of ambient light to the user's eye (Fig. 5). Furthermore, Rallison teaches the allowance of ambient light to the user's eye (col. 2, lines 63-67 and col. 3, lines 1-5). Also, Handschy discloses an assembly for producing a visual image, in which the

assembly uses a cube that is transparent. This assembly would also allow ambient light to transmit or pass through the assembly. The assembly can comprise additional cubes or a single cube (col. 10, lines 34-43). Claim 19 is dependent on claim 13 is rejected on the same basis and what is stated above.

As pertaining to claim 28, Amafuji teaches the device of claim 1, further comprising a housing, the projection system disposed within the housing, circuits and wiring in electrical communication with the projection system disposed within the housing, and the support fixture attached to the housing (Fig. 5-6). Claim 28 dependent on claim 13 and is rejected on the same basis and what is stated above.

As pertaining to claim 40, Amafuji teaches a computer in communication with the display device of claim 13 (col. 1, lines 4-7). Claim 40 is dependent on claim 13 and is rejected on the same basis and what is stated above.

7. **Claims 16-18, 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison, Ronzani and Handschy as applied to claim 13 or 14 above, and further in view of Fan et al. (hereinafter "Fan"), US 5,815,126.

As pertaining to claim 16, Amafuji, Rallison, Ronzani and Handschy disclose what has previously been stated above.

As pertaining to claim 16, they do not disclose the eyepiece assembly further comprises a lens having an outer surface forming a part of the spherical housing and an inner surface, the curvatures of the outer surface and the inner surface selected to provide a desired degree of magnification or aberration correction of light.

As pertaining to claim 16, Fan discloses wherein the eyepiece assembly further comprises a lens having an outer surface forming a part of the curved housing and an inner surface, the curvatures of the outer surface and the inner surface selected to provided a desired

degree of magnification or aberration correction of light on the axial optical path (col. 13, lines 35-65; Fig. 22, 25).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the housing features of Fan with those of Amafuji, Rallison, Ronzani and Handschy.

The suggestion/motivation for doing so would have been to provide because it allows for increased or improved observation in which there is a higher luminance and definition of the picture being observed by the user. Claim 16 is dependent on claim 13 and is rejected on the same basis and what is stated above

As pertaining to claim 17-18, Fan discloses the device of claim 13, wherein the curved housing includes an internal surface having a curvature selected to form a lens (Fig. 19, 22). Fan states that any lens system can be incorporated into the optical system (col. 13, lines 49-65), therefore as a design choice any lens system would work with this system. Claims 17 and 18 are dependent on claim 13 and are rejected on the same basis and what is stated above.

As pertaining claim 20, it would be obvious, the device of claim 13, wherein the curved housing is coated with a scratch resistant coating or an antireflection coating. Some materials, which would be used to make the housing, would not need an antireflection coating because light does not reflect off them, i.e. ABS plastic, a dark-dull paint etc. Furthermore, the same can be said of the scratch resistant coating because in essence this coating does not really prevent scratches from happening it just allows or depends how deep the scratch occurs, it would also depend on how many coats would have to be put to allow for the scratches to be buffed out, but more coatings would be some extra weight being put on the eyepiece assembly. Claim 20 is dependent on claim 13 and is rejected on the same basis and what is stated above.

8. **Claim 21-22, 24, 28 and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji and Rallison in view of Carollo, US 6,144,439.

As pertaining to claim 21, Amafuji and Rallison disclose what has been previously stated above.

As pertaining to claim 21, they do not disclose the eyepiece assembly having a solid optical material having an external surface and an internal reflective surface, the material having an index of refraction so the light incident on the external surface is refracted as the light propagates into the material and is reflected off the internal surface.

Carollo discloses an image system, which has a material with an external surface, and an internal reflecting surface and it is a meniscus lens 220. It is obvious that there is an index of refraction because the light bends as it enters the image system as shown by Figure 2, the light is refracted onto CLC (cholesteric liquid crystal), which in turn reflects the light back to 220, in which the light is reflected and then refracted to the user's eye (col. 3, lines 7-39; Figure 2).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the image display of Carollo with Amafuji and Rallison.

The suggestion/motivation for doing so would have been to provide a better eye assembly for producing more efficient images that would entitle the image to have higher contrast, resolution, luminance and cleanliness.

As pertaining to claim 22, Carollo teaches the device of claim 21, wherein the reflective surface comprises a holographic film (col. 3, lines 34-37). Claim 22 is dependent on claim 21 and is rejected on the same basis and what is stated above.

As pertaining to claim 24, Carollo teaches the device of claim 21, wherein the reflective surface is a paraboloid (Figure 2). Claim 24 is dependent on claim 21 and is rejected on the same basis and what is stated above.

As pertaining to claim 28, Amafuji teaches the device of claim 1, further comprising a housing, the projection system disposed within the housing, circuits and wiring in electrical communication with the projection system disposed within the housing, and the support fixture attached to the housing (Fig. 5-6). Claim 28 dependent on claim 21 and is rejected on the same basis and what is stated above.

As pertaining to claim 43, Amafuji teaches a computer in communication with the display device of claim 21 (col. 1, lines 4-7). Claim 43 is dependent on claim 21 and is rejected on the same basis and what is stated above.

9. **Claim 23 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison and Carollo as applied to claim 21 above, and further in view of Takahashi, US 5,701,202.

Amafuji, Rallison and Carollo disclose what has previously stated above.

They do not disclose the reflecting surface is spherical or aspherical.

Takahashi discloses almost the exact same invention as Carollo but the reflective surface is aspherical (col. 6, lines 25-27).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the reflective surface of Takahashi with Amafuji, Rallison and Carollo.

The suggestion/motivation for doing so would have been to provide a better eye assembly in which it can correct aberration due to a spherical type device for producing a better or more enhanced image. The image would include a higher contrast, resolution, etc. Claim 23 is dependent on claim 21 and is rejected on the same basis and what is stated above.

As pertaining to claim 25, it would be obvious the device of claim 21, wherein the reflective surface is partially transmitting and the eyepiece assembly further includes a section adjacent the reflective surface selected to reduce refraction of ambient light passing through the

reflective surface into the solid optical material. It is obvious because ambient light plays a major role when it comes to the image being displayed. Excess ambient light would cause the picture to become distorted, i.e. not clear, bad resolution, bad contrast. Therefore, it would be obvious that eye assembly have some way to reduce the refraction of ambient light because the user would want to view or see the image as the best as it can be. Claim 25 is dependent on claim 21 and is rejected on the same basis and what is stated above.

10. **Claims 26-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison and Carollo as applied to claim 21 above, and further in view of Ronzani.

As pertaining to claims 26-27, Amafuji, Rallison and Carollo describe what has previously been stated above.

As pertaining to claims 26-27, they do not describe the eyepiece assembly disposed in a curved or spherical housing.

As pertaining to claims 26-27, Ronzani discloses a HMD display in which the eyepiece assembly is hollow and spherical and therefore curved (figs. 1-9).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the curved eyepiece assembly of Ronzani with that of Amafuji, Rallison and Carollo.

The suggestion/motivation for doing so would have been to provide for a better eyepiece assembly which can be encased or housed to allow for a better image to be produce without any outside distractions or interferences, i.e. wind, rain, snow etc. Claims 26-27 are dependent on claim 21 and are rejected on the same basis and what is stated above.

11. **Claims 30-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison, Ronzani, Handschy and Carollo as applied to claim 1 or 13 or 21 or 28 above, in view of Lebby et al. (hereinafter "Lebby"), US 5,469,185.

As pertaining to claims 30-32, Amafuji discloses what has previously been stated above. Furthermore, Amafuji discloses the microphone 208a is mounted on a boom 208b and both are mounted on a headband 203. Amafuji does not disclose the microphone supported by the housing, microphone mounted on a boom and an earpiece supported by the housing.

As pertaining to claims 30-32, Lebby discloses head mounted display in which the microphone 54 is mounted on a boom, and an earpiece 52, in which both of these are supported by the housing 56 (Fig. 4).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the design of Lebby with Amafuji.

The suggestion/motivation for doing so would have been to provide a different design that is not necessarily better but maybe less cumbersome, to when the user is putting the apparatus on. Claims 30-32 are dependent on claims 1 and 28 and are rejected on the same basis and what is stated above.

12. **Claims 33-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison, Ronzani, Handschy and Carollo as applied to claim 1 or 13 or 21 or 28 above, in view of Fan et al (hereinafter "Fan"), US 5,815,126.

As pertaining to claims 33-35, Amafuji discloses what has previously been stated above. Furthermore, Amafuji discloses the microphone 208a is mounted on a boom 208b and both are mounted on a headband 203. The examiner feels that these claims and the preceding claims are of a design choice because they do not add any benefit to how the apparatus functions. However, with that in mind Amafuji does not disclose the housing attached to a boom, in which the boom is attached to the headband, a microphone support by the headband and an earpiece supported by the headband.

As pertaining to claims 33-35, Fan discloses many different designs in which there could be many different combinations to how each of the following could be attaché. The housing 1100 can be attached to a boom as shown on Figs. 32A-32B and 33 and they are attached to a headband, the microphone and earpiece can be attached to the headband or not as shown in Figs. 32A, 33 and 34A.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the designs of Fan with Amafuji, Rallison, Ronzani, Handschy and Carollo.

The suggestion/motivation for doing so would have been to provide different designs choices to allow for a less cumbersome apparatus. Claims 33-35 are dependent on claims 1 and 28, 13 and 28 and 21 and 28 and are rejected on the same basis and what is stated above.

13. **Claim 36** is rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji and Rallison as applied to claim 1 above, in view of Newman et al. (hereinafter "Newman"), US 5,844,824.

Amafuji and Rallison disclose what has been previously stated above. Also, Amafuji discloses that the display system can have a wireless modem (col. 12, lines 65-67; col. 13, lines 1-14). They do not disclose the display system can be in communication with a cellular phone.

Newman discloses that a head mounted display can be in communication with a cellular phone (col. 9, lines 43-67; col. 10, lines 1-67 and col. 1, lines 1-42).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the communication capabilities of Newman with Amafuji and Rallison.

The suggestion/motivation for doing so would have been provide the display system with another communication device, in this case a cellular phone so as maybe to do multi-tasking with a phone or something else and this also allows the image to be magnified without causing

strain on the user's eye. Claim 36 is dependent on claim 1 and is rejected on the same basis and what is stated above.

14. **Claim 38** is rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji and Rallison as applied to claim 1 above, in view of Horiuchi, US 6,304,234 B1.

Amafuji and Rallison disclos what has been previously stated above. Also, Amafuji discloses that the display system can have a wireless modem (col. 12, lines 65-67; col. 13, lines 1-14). They do not disclose the display system can be in communication with a personal digital assistant (PDA).

Horiuchi discloses that the head mounted device used can be in communication with a PDA to allow the user to see a bigger image of the screen of the PDA (col. 1, lines 4-9; col. 3, lines 19-23; Fig. 1A).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the communication capabilities of Horiuchi with Amafuji and Rallison.

The suggestion/motivation for doing so would have been to provide another way to communicate with a portable device, in this case a PDA. This also allows for multi-tasking to take place, as in input phone numbers, names, play games, etc. but with a magnified image without causing strain on the user's eyes. Claim 38 is dependent on claim 1 and is rejected on the same basis and what is stated above.

15. **Claim 39** is rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison, Ronzani and Handschy as applied to claim 13 above, in view of Newman et al. (hereinafter "Newman"), US 5,844,824.

Amafuji, Rallison, Ronzani and Handschy disclose what has been previously stated above. Also, Amafuji discloses that the display system can have a wireless modem (col. 12,

lines 65-67; col. 13, lines 1-14). They do not disclose the display system can be in communication with a cellular phone.

Newman discloses that a head mounted display can be in communication with a cellular phone (col. 9, lines 43-67; col. 10, lines 1-67 and col. 1, lines 1-42).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the communication capabilities of Newman with Amafuji, Rallison, Ronzani and Handschy.

The suggestion/motivation for doing so would have been provide the display system with another communication device, in this case a cellular phone so as maybe to do multi-tasking with a phone or something else and this also allows the image to be magnified without causing strain on the user's eye. Claim 39 is dependent on claim 13 and is rejected on the same basis and what is stated above.

16. **Claim 41** is rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison, Ronzani and Handschy as applied to claim 13 above, in view of Horiuchi, US 6,304,234 B1.

Amafuji, Rallison, Ronzani and Handschy disclose what has been previously stated above. Also, Amafuji discloses that the display system can have a wireless modem (col. 12, lines 65-67; col. 13, lines 1-14). They do not disclose the display system can be in communication with a personal digital assistant (PDA).

Horiuchi discloses that the head mounted device used can be in communication with a PDA to allow the user to see a bigger image of the screen of the PDA (col. 1, lines 4-9; col. 3, lines 19-23; Fig. 1A).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the communication capabilities of Horiuchi with Amafuji, Rallison, Ronzani and Handschy.

The suggestion/motivation for doing so would have been to provide another way to communicate with a portable device, in this case a PDA. This also allows for multi-tasking to take place, as in input phone numbers, names, play games, etc. but with a magnified image without causing strain on the user's eyes. Claim 40 is dependent on claim 13 and is rejected on the same basis and what is stated above.

17. **Claim 42** is rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison and Carollo as applied to claim 21 above, in view of Newman et al. (hereinafter "Newman"), US 5,844,824.

Amafuji, Rallison and Carollo disclose what has been previously stated above. Also, Amafuji discloses that the display system can have a wireless modem (col. 12, lines 65-67; col. 13, lines 1-14). They do not disclose the display system can be in communication with a cellular phone.

Newman discloses that a head mounted display can be in communication with a cellular phone (col. 9, lines 43-67; col. 10, lines 1-67 and col. 1, lines 1-42).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the communication capabilities of Newman with Amafuji, Rallison and Carollo.

The suggestion/motivation for doing so would have been provide the display system with another communication device, in this case a cellular phone so as maybe to do multi-tasking with a phone or something else and this also allows the image to be magnified without causing

strain on the user's eye. Claim 42 is dependent on claim 21 and is rejected on the same basis and what is stated above.

18. **Claim 44** is rejected under 35 U.S.C. 103(a) as being unpatentable over Amafuji, Rallison and Carollo as applied to claim 13 above, in view of Horiuchi, US 6,304,234 B1.

Amafuji, Rallison and Carollo disclose what has been previously stated above. Also, Amafuji discloses that the display system can have a wireless modem (col. 12, lines 65-67; col. 13, lines 1-14). They do not disclose the display system can be in communication with a personal digital assistant (PDA).

Horiuchi discloses that the head mounted device used can be in communication with a PDA to allow the user to see a bigger image of the screen of the PDA (col. 1, lines 4-9; col. 3, lines 19-23; Fig. 1A).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the communication capabilities of Horiuchi with Amafuji, Rallison, and Carollo.

The suggestion/motivation for doing so would have been to provide another way to communicate with a portable device, in this case a PDA. This also allows for multi-tasking to take place, as in input phone numbers, names, play games, etc. but with a magnified image without causing strain on the user's eyes. Claim 44 is dependent on claim 21 and is rejected on the same basis and what is stated above.

Response to Arguments

19. Applicant's arguments with respect to claims 1-44 have been considered but are moot in view of the new ground(s) of rejection.

As per claims 1-12, of REMARKS, page 6-7: Rallison has been combined with

Amafuji to disclose a HMD with an on-axis or axial system. Even though claim 10 was amended to cancel the "axial" optical path and claim 1 was amended to state an axial system, which encompasses the whole the eyepiece assembly to be one as a system or device or part, this renders the claims to be substantially different and thus makes claims 1-12 final. An axial path and axial system are two different identities in which anything image can be projected through an axial path, however, again an axial system is different because it then makes the eyepiece assembly a system or device that must be axial or on-axis.

As per claims 13-22, of REMARKS, page 7-8: Ronzani and Handschy were combined with Amafuji and Rallison to disclose the eyepiece assembly to be hollow, transparent, spherical housing. Ronzani clearly shows the eyepiece assembly to be spherical and hollow and combined with Handschy it would transparent and thus claims 13-22 are final.

As per claims 21-27, of REMARKS, page 8-9: the examiner disagrees with the applicant. Carollo discloses a meniscus lens 220 that has an external and internal surface. After the light passes the external surface of lens 220 the light is refracted and is transmitted to a CLC that reflects it back to the internal surface of lens 220. The light is then reflected from the internal surface of lens 220 to the eye. Claim 21, which was amended to be an independent claim is rejected by Carollo and Amafuji and Rallison and thus 21-28 are final.

Claims 28-44 have been rejected using the same references as before and thus are made final.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Michael J. Moyer** whose telephone number is **(703) 305-2099.** The examiner can normally be reached Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Steven Saras**, can be reached at **(703) 305-9720.**

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the **Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.**

MJM
March 17, 2003

Michael J. Moyer
Examiner
Art Unit 2675

STEVEN SARAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600